

Railroad Industry Perspective on Sustainability

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By: Ken Dorsey
Association of American Railroads





Overview of Presentation

- Major Sections of Railroad Sustainability / Environmental Reports
 - Fuel Efficiency / Alternative Fuels / Renewable Energy / Technology
 - Water, Wastewater, Stormwater Treatment
 - Waste Minimization / Recycling
 - Other Environmental
- Metrics
- Other Key Sections



Train Operations Fuel Efficiency

- New more fuel efficient locomotives (new and re-built)
 - New road locomotives and Genset switchers
 - Locomotive research projects
 - Green Goat Locomotives
- Train performance optimizers
 - Fuel Trip Optimizer (FTO)
 - RailEdge Movement Planner
 - Event Recorder Automated Download (ERAD)
 - LEADER
 - Tons Per Axle (TPA)
- Engine start stop systems / Auxiliary Power Units (APU's)
- Training of crews to minimize fuels use
 - Fuel Masters Unlimited
 - Engine shutdown policies



Train Operations Fuel Efficiency (cont.)

- More efficient operating plans / route optimization
 - Reduce empty carloads
 - Unified Train Control System - Movement Planner
 - Continuous improvement
- Improved aerodynamics
 - Aero Wedge
- Rail lubrication (Gage face – Top-of-Rail – Tangent Track)
 - Solar powered dispensers
- Modal shift
- Results
 - Trains move the same ton of freight more than three times as far as trucks per gallon of fuel
 - Trains produce nearly one-quarter fewer carbon dioxide emissions per ton mile than trucks
 - Trains emit less than 1/7th the PM, and 1/3rd the NOx and CO compared to trucks



Energy Efficiency Other

- Intermodal equipment e.g. cranes, trucks, and yard tractors
 - Preventative maintenance
 - Operator training
 - Route optimization
 - Aerodynamic equipment
 - Reducing terminal dwell time for motor carriers
- Building efficiency: lighting, heating, energy efficient design
 - Leadership in Energy and Environmental Design (LEED)
 - The Green Building Council
 - Occupancy sensors
 - Use of natural lighting
 - Computer control of building heating and air conditioning



Alternative Fuels / Renewable Energy

- Train operations
 - Bio-diesel 5-20%
 - Natural gas switcher
 - Ultra Low Sulfur Fuel diesel fuel
 - Battery-powered switcher
 - Dual-engine diesel locomotive
 - Ethanol powered locomotive
- Other
 - Wood pellets
 - Wind turbines
 - Solar power signals, wayside rail lubrication and detectors, water heaters, lighting, microwave communications and wastewater treatment



Air Quality

- **Commitments to reduce GHG emissions**
 - One railroad committed to a five-year goal to reduce their carbon footprint by 10 percent per revenue ton-mile of freight
- **Results**
 - According to EPA all freight railroads contribute less than 1 percent of the greenhouse gas emissions in the US compared to 5.8 percent for trucking
 - If just 10 percent of the long distance freight that currently moves by highway switched to rail, annual greenhouse gas emissions would fall by approximately 12 million tons
 - One AAR member received a score of 91 in the Carbon Disclosure Project's 2010 S&P 500® report, the highest score for an industrial company



Water, Wastewater, Stormwater Treatment / Management and Other Environmental

- Wastewater is treated to meet and exceed NPDES or POTW standards as appropriate
 - One member alone has 149 discharge permits
 - Some railroads recycle wastewater for other uses like locomotive and parts washing
- Results: At least one railroad reported no non-compliances in the latest reporting year
- Other Environmental
 - Environmental Management Systems
 - Railroads establish environmental performance metrics tracked by senior management
 - Environmental assessments are completed to assess impact of construction projects as appropriate



Environmental General (cont.)

- Capital Projects
 - WWTP upgrades
 - Above-ground storage tank dike liners
 - Tank car / fuelling spill pans
- Remediation
- Clean right-of-way policies
- Employee training
- Other programs include:
 - Vegetation management
 - Ecosystem management
 - Wildlife management



Waste Minimization / Recycling

- Waste lubricating oil is recycled or burned for energy recovery
- Automatic fuel shutoff devices are used to minimize spillage
- Locomotive retention tanks collect oil leaks
- The industry replaces 17 million crossties annually
 - 50% of those ties go to co-generation (energy recovery)
 - The vast majority of the rest are reused in less severe railroad service or sold for landscape timbers
- In 2009, the railroads removed 561,876 tons of new rail
 - The rail is either reused in less severe service or sold as scrap
 - Similar practices are in place for other railroad equipment e.g. scrap cars, locomotives, wheels and axles, etc.
- Other wastes are also recycled including batteries, paper, electronic wastes, engine coolant, fuel collected at fueling facilities, bottles and cans, printer cartridges, etc.



Metrics

- Emissions / energy
 - Metric tons of CO₂, NO_x, SO_x, PM, HC, CO, by year (by source)
 - Fuel used (million gallons)
 - Gross ton miles or revenue ton miles per gallon
- Land
 - Site assessments and land reclamation costs (\$million)
 - Sites rehabilitated (#)
 - Remediation reserve (\$million)
 - Spent on remediation (\$million)
- Environmental Incidents (#)
- National Park Grizzly Bear Mortalities (#)



Metrics (cont.)

- Waste
 - Total waste generated (metric tons)
 - Ties removed (millions)
 - Liquid waste generated (thousand gallons)
 - Liquid waste recycled (%)
 - Solid waste generated (tons)
 - Solid waste recycled (%)
 - Steel recycled (tons)
 - Ties disposed (#)
 - Portion of ties burned for energy recovery (%)
 - Used oil recycled (gallons)
 - Batteries recycled (pounds)
 - Hazardous waste disposed (pounds)



Other Key Sections

- Top Management Support / Commitment
 - Overall statement
- Stakeholder Engagement
 - Communities
 - Customers
- Safety
 - Hazardous Materials Safety
- Auditing
- Public Transportation
- Sustaining Effective Workforce / Employee Health
- Measures
- Externalities
- Recognition



Thank You

Questions

Ken Dorsey
Executive Director Tank Car Safety
Association of American Railroads
425 Third Street, S.W.
Washington, DC 20024
Phone: 202-639-2262
Email: KDorsey@aar.org

